PART 1 - GENERAL

1.1 RELATED SECTIONS

1.1.1 Related Sections: The following sections contain requirements that relate to this section and are performed by other trades.

a. Section 01575 – Temporary Environmental Controls: protection of floor openings and personnel barriers; temporary power and lighting.

b. Section 02301 – Earthwork for Structures and Pavement: excavation for cylinder well casing.

c. Section 03300 – Cast-In-Place Concrete: elevator pit, elevator motor and pump foundation, and grouting thresholds.

d. Section 05120 – Structural Steel: divider beams, support for entrances and rails, hoisting beam at top of hoistway.

e. Section 05500 – Metal Fabrications: pit ladder.

f. Section 13852 – Interior Fire Detection and Alarm System: fire and smoke detectors and interconnecting devices; fire alarm signal lines to contacts in the machine room.

g. Section 16402 – Interior Distribution System: electrical service to main disconnect in elevator machine room; electrical power for elevator installation and testing; electrical-disconnecting device to elevator equipment prior to activation of sprinkler system; electrical service for machine room; machine room and pit receptacles with ground-fault current protection; lighting in machine room and pit; wiring for telephone service to machine room.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. Comply with applicable building codes and elevator codes at the project site, including but not limited to the following:

AMERICAN NATIONAL STANDARDS INSTITUTE

ANSI A117.1	Buildings and Facilities, Providing Accessibility and Usability for Physically Handicapped People

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME A17.1	(1996; Addenda 1997) Safety Code for Elevators and Escalators

AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES

ADAAG	Americans with Disabilities Act Accessibility Guildelines

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO)

ICBO UBC (1997) Uniform Building Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (1999) National Electrical Code

NFPA 80 Fire Doors and Windows

UNDERWRITERS LABORATORIES INC. (UL)

UL 10B (1997) Fire Tests of Door Assemblies

1.3 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

1.3.1 SD-02, Shop Drawings

Submit approval layout drawings. Include the following:

a. Car, guide rails, buffers and other components in hoistway

b. Maximum rail bracket spacing

c. Maximum loads imposed on guide rails requiring load transfer to building structure

d. Loads on hoisting beams

e. Clearances and travel of car

f. Clear inside hoistway and pit dimensions

g. Location and sizes of access doors, hoistway entrances and frames

1.3.2 SD-03, Product Data

Submit manufacturer’s product data for each system proposed for use. Include the following:

a. Signal and operating fixtures, operating panels and indicators

b. Cab design, dimensions and layout

c. Hoistway-door and frame details

d. Electrical characteristics and connection requirements

e. Expected heat dissipation of elevator equipment in machine room (BTU).

1.3.3 SD-10, Operation and Maintenance Data

a. Elevator, Data Package 4

b. Maintenance and repair action plan

Submit data package in accordance with Section 01781, "Operation and Maintenance Data."

1.4 QUALITY ASSURANCE

1.4.1 Manufacturer

Provide elevators manufactured by a firm with a minimum of 10 years experience in fabrication of elevators equivalent to those specified.

1.4.2 Installer

Elevators shall be installed by the manufacturer.

1.4.3 Shop Drawing Requirements

Show assembly and arrangement of elevators, accessories, and supporting systems. Show location of machinery and controls in machine room. Provide details for materials and equipment, including operating and signal fixtures, doors, door and car frames, car enclosure, controllers, motors, guide rails and brackets, layout of hoistway in plan and elevation, and other layout information and clearance dimensions. Submit complete wiring diagrams and sequence of operations, showing electrical connections and functions of elevator systems, for machine room, hall, and hoistway area. Submit one set of wiring diagrams in plastic or glass cover, framed and mounted in elevator machine room. Deliver other sets to Contracting Officer. Coded diagrams are not acceptable unless adequately identified.

1.4.4 Product Data Requirements

Include information on motor, pump, gages, piston and cylinder, piping and valves, hall station, and buffer on elevators and accessories. For elevator supporting systems, include information on car control systems. On data sheets, provide document identification number or bulletin number, published or copyrighted prior to the date of contract bid opening.

1.4.5 Regulatory Requirements

Elevator system design and installation shall comply with the latest versions of ASME A17.1

a. Elevator shall be designed in response to Americans With Disabilities Act Accessibility Guidelines (ADAAG).

1.4.6 Permits and Inspections

Provide licenses and permits and perform required inspections and tests.

1.4.7 Certificates: Welders' Requirements

Comply with AWS D1.1, Section 5. Include certified copies of welders' qualifications. List welders' names with corresponding code marks to identify each welder's work.

1.5 DELIVERY, STORAGE, AND HANDLING

Should the building or the site not be prepared to receive the elevator equipment at the agreed upon date, the General Contractor will be responsible to provide a proper and suitable storage area on or off the premises.

Should the storage area be off-site and the equipment not yet delivered, then the elevator contractor, upon notification from the General Contractor, will divert the elevator equipment to the storage area. If the equipment has already been delivered to the site, then the General Contractor shall transport the elevator equipment to the storage area. The cost of elevator equipment taken to storage by either party, storage, and redeliver to the job site shall not be at the expense of the elevator contractor.

1.6 NEW INSTALLATION SERVICE

A quality maintenance service consisting of regular examinations, adjustments and lubrication of the elevator equipment shall be provided by the elevator contractor for a period of twelve (12) months after the elevator has been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the elevator contractor. All work shall be performed by competent employees during regular working hours of regular working days and shall include emergency 24-hour callback service. This service shall not cover adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents caused by persons other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.

1.6.1 Documentation

Document all inspection and testing. Maintain copy of documentation in machine room.

1.6.2 Maintenance and Diagnostic Tools

Provide all special tools and software necessary to service and maintain each elevator; deliver at time of final acceptance. Provide one of each tool per group of elevators. Include solid state or microprocessor diagnostic tools unavailable on the open market. Provide necessary diagnostic software in cases where the solid state or microprocessor diagnostic tools are available on the open market.

1.6.3 Keys for Elevator Key Switches

Provide minimum of twelve keys per unique cylinder used on all key switches for single elevator. If more than one elevator, additional keys not required unless there are additional unique cylinders. Keys shall be provided with brass or fiberglass tags marked 'PROPERTY OF THE U. S. GOVERNMENT' on one side with function of key or approved code number on other side.

1.7 WARRANTY

The elevator contractor's warranty covers defective material and workmanship. The guarantee period shall not extend longer than one (1) year from the date of completion or acceptance thereof by beneficial use, whichever is earlier, of each elevator. The guarantee excludes ordinary wear and tear or improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.

1.8 MAINTENANCE

1.8.1 Maintenance and Repair Action Plan

Provide plan of action by the Elevator Installation Contractor to provide emergency and routine maintenance in accordance with paragraph entitled "New Installation Services". In addition to data package "SD-10, Operations and Maintenance Manuals", provide a phone number list, personnel contacts, and all tools to be provided to the Contracting Officer.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

Provide hydraulic elevators by Otis Elevator Company or approved equal. Design is based on elevator model number “LVM 3500” by Otis Elevator. If a different type of elevator is selected, Contractor is responsible for submitting a revised design for elevator pit, foundation, shaft and floor and roof framing for review by the Government.

2.2 ELEVATOR DESCRIPTION

Provide elevator system that complies with ASME A17.1 in its entirety, ASME/ANSI A17.2.2 in its entirety, and additional requirements specified herein.

2.2.1 Performance Requirements for Elevators:

a. Quantity & Elevator Numbers: 2

b. Type: (Arrangement #2) Single direct acting hydraulic cylinder in well hole.

c. Number of Stops: 3 front

d. Number of Openings: 3 at Front.

e. Rise: 30-8”

Note: Maximum Rise for Arrangement. #1, #2, & #3 will depend upon the load on platen. Load on platen is determined by the duty, speed, rise, weight of the cab enclosure, elevator car frame and platform. The architecturals inside an elevator cab will affect the weight of the cab enclosure.

f. Rated Capacity/Speed: 3500 pounds,25 fpm

g. Minimum Car Inside**:** Front Opening 6’ 8” wide x 5’ 5” deep

h. Inside Cab Height: 8’-0”

i. Height Under Ceiling: 7’-4 1/2”

j. Entrance Width & Type: Center-Open. Doors 3’ 6” x 7’ 0”

k. Main Power Supply: 480 Volts + or - 5% of normal, 3 Phase, with a separate equipment grounding conductor.

l. Lighting Power Supply: 120 Volts, 1 Phase, 15 Amp, 60 Hz.

m. Stopping Accuracy: ±1/4" under any loading condition or direction of travel.

n. Door Opening Time: 2.5 seconds

2.2.2 Duplex Collective Operation

Using a microprocessor-based controller, the operation shall be automatic by means of the car and hall buttons. In the absence of system activity, one car can be made to park at the pre-selected main landing. The other (free) car shall remain at the last landing served. Only one car shall respond to a hall call. If either car is removed from service, the other car shall immediately answer all hall calls, as well as its own car calls.

2.2.3 Car Operating Features

a. Full Collective Operation.

b. Single Speed Fan.

c. On/Off Light Switch.

d. Remote elevator monitoring REM® ready.

e. Car-Stall Protection.

f. Firefighters' Service Phase I and Phase II.

g. Top of Car Inspection.

h. Solid State Starting.

2.2.4 Door Control Features:

Closed Loop Door Operator is a closed loop, microprocessor based door operator system. The door operator will facilitate smooth operation under varying environmental influences such as, temperature, wind, friction, and component variation. The processor will monitor the door's actual position and velocity compared to its desired position and velocity. If variations are detected in the profile the command will be automatically corrected. The Closed Loop Door Operator control system shall not require machine room door control equipment.

a. Door noise not to exceed 58dBA.

b. Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.

c. Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.

d. Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person.

e. Primary door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening. Under normal operation and for any door position, the system shall detect as a blockage an opaque object that is equal to or greater than 1.3 inches in diameter when inserted between the car doors at vertical positions from within 1 inch above the sill to 71 inches above the sill. Under degraded conditions (one or more blocked or failed beams), the primary protection shall detect opaque objects that are equal to or greater than 4" in diameter for the same vertical coverage. If the system performance is degraded to the point that the 4" object cannot be detected, the system shall maintain the doors open or permit closing only under nudging force conditions.

f. The door reopening device shall also include a secondary, three dimensional, triangular infrared multi-beam array projecting across the door opening and extending into the hoistway door zone. The door opening device will cause the doors to reopen when it detects a person(s) or object(s) entering or exiting the car in the area between the hoistway doors or the entryway area adjacent to the hoistway doors.

g. The size of the secondary protection zone shall vary as the door positions vary during opening and closing. The width of the zone shall be approximately one-third the size of the separation between the doors (or door and strike plate for single-slide doors) and shall be approximately centered in the door separation. In order to minimize detection of hallway passers-by who are not entering the elevator, the maximum zone penetration into the entryway shall not exceed 20" for any door separation. Normal penetration depth into the entryway from the car doors shall be ~14" for a door separation of 42". The penetration shall reduce proportionally as the doors close. At door separations of 18" or less the secondary protection system may cease its normal operation since the depth of the zone recedes to where it is inside the hoistway doors. The vertical coverage of the secondary protection shall be ~19" above the sill to ~55" above the sill (mid-thigh to shoulder of a typical adult).

h. The secondary protection shall have an anti-nuisance feature which will ignore detection in the secondary zone after continual detection occurs for a significant time period in the secondary zone without corresponding detection in the primary protection zone; i.e. a person/object is in the entryway but does not enter. Normal secondary protection shall be re-enabled whenever a detection occurs in the primary zone.

i. The reaction time of the door detector sub-system shall not exceed 60 milliseconds when both primary and secondary protection capabilities are active; nor 40 milliseconds when the secondary protection is disabled.

j. Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.

2.2.5 Seismic Requirements

Provide equipment according to Seismic zone**:** 2, California Title 8, & 24

2.3 EQUIPMENT: MACHINE ROOM COMPONENTS

The hydraulic system shall be of compact design suitable for operation under the required pressure. The power component shall be mounted in the hydraulic-fluid storage tank. The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control**:** up and down starting, acceleration, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. All

of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. System to be provided with a muffler, low-pressure switch and a shut-off valve.

A microprocessor-based controller shall be provided, including necessary starting switches together with all relays, switches, solid-state components and hardware required for operation, including door operation, as described herein. A three (3)phase overload device shall be provided to protect the motor against overloading.

A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.

Plunger(s) and Cylinder(s)**:**Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to it to prevent the plunger from leaving the cylinder. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.

A sealed PVC cylinder protection system shall be installed. The system shall provide a means to monitor the space between the PVC sleeve and cylinder wall and evacuate unwanted fluids, so as to prevent such fluids from remaining in contact with the cylinder.

Tank Heater.

Low-oil control (where required).

Ladder meeting requirements of ANSI A17.1.

2.4 EQUIPMENT: HOISTWAY COMPONENTS

2.4.1 Car Frame

A suitable car frame shall be provided with adequate bracing to support the platform and car enclosure. The buffer striking plate on the underside of the car-frame platform assembly must fully compress the spring buffer mounted in the pit before the plunger reaches its lower limit of travel.

2.4.2 Platform, Heavy Loading Type

The car platform shall be arranged to accommodate one-piece loads weighing up to 25% of the rated capacity, such as wheeled food carts, stretchers, x-ray equipment, etc. The platform shall be recessed 5/16” for flooring by others.

2.4.3 Car Guide Rails

Tee-section steel rails with brackets and fasteners.

2.4.4 Spring Buffer

Helical coil spring type.

2.4.5 Wiring

Wiring for hoistway electrical devices included in scope of the elevator system, hall panels, pit emergency stop switch, and the traveling cable for the elevator car.

2.5 CAB ENCLOSURE

2.5.1 Vertical Light-Weight Series 1

Cab walls to have attached vertical non-removable panels, laminated front and back with plastic laminate.

2.5.2 Steel Cab Series 3

Cab walls to be of 14-gauge sheet steel with powder paint finish. Color to be selected from the manufacturer's standard color chart.

2.5.3. Car Finish

2.5.3.1 Car Front Finish

Car front(s) and door finish to be powder paint finish. Color to be selected from the manufacturer's standard color chart.

2.5.3.2 Car Door Finish

Car front(s) and door finish to be powder paint finish. Color to be selected from the manufacturer's standard color chart.

2.5.3.3 Car Top

Car top to be of wood material clad on both sides with a natural finish aluminum panel.

2.5.4 Ceiling Type

Aluminum Eggcrate DC22E Ceiling suspended ceiling shall consist of aluminum eggcrate diffusers set in frame of extruded aluminum with fluorescent lighting fixtures.

2.5.5 Emergency Car Lighting

An emergency power unit employing a 12 volt, sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car and provide current to the alarm bell in the event of building power failure.

2.5.6 Exhaust Fan

An exhaust fan shall be mounted on the car top.

2.5.7 Utility Outlet

A 125V 15 amperes utility outlet with ground-fault circuit-interrupter protection shall be furnished in the cab.

2.5.8 Handrail Type

Rectangular Tubular Metal Bar DH50 Handrails 1/2" x 1-1/2" satin finish stainless steel provided on the rear of the car enclosure.

2.5.9 Threshold

Threshold shall be aluminum.

2.5.10 Protective Pads

Protective pad hooks and quilted fire retardant protective pads. Pad Buttons will be provided with non-suspended ceiling (DC124).

2.6 EQUIPMENT: HOISTWAY ENTRANCES

2.6.1 Frames

Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of 14-gauge sheet steel. Additional sill angle support will be provided with 4'0" and 4'6" two speed opening door arrangements (4500 & 5000 lb. cars). Sills shall be extruded aluminum.

2.6.2 Doors

Entrance doors shall be of hollow metal construction with vertical internal channel reinforcements.

2.6.3 Fire Rating

Entrance and doors shall be UL fire rated for 1-1/2 hour.

2.6.4 Entrance Finish

All floors frame and door - with powder paint. Color to be selected from the manufacturer's standard color chart.

2.6.5 Entrance Markings

Entrance jambs shall be marked with 4" x 4" plates having raised floor markings with Braille adjacent. Markings shall be provided on both sides of the entrance.

2.6.6 Sight Guards

Black sight guards will be furnished with any metal finish door. Powder paint matching sight guards will be furnished with powder paint doors.

2.7 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

2.7.1 Car-Operating Panel

A panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. Raised markings and Braille markings shall be provided for each push-button.

a. Car Fixture Finish: satin stainless steel.

b. Applied car operating panel shall be furnished. It shall contain a bank of square mechanical illuminated buttons marked to correspond to the landings served, an emergency call button, door open and door close buttons, and switches for lights, inspection and the exhaust fan. The emergency call button shall be connected to a bell that serves as an emergency signal. All buttons to have both raised and Braille markings. LED (red) button illumination with 1/8" projecting target.

2.7.2 Car Position Indicator

A 16-segment, digital, vacuum fluorescent car position indicator shall be integral to the car operating panel.

2.7.3 Telephone Cabinet with Certificate Frame (Series 1)

A telephone compartment shall be furnished in the return panel below the car-operating panel for Series 1. Necessary wires for the telephone shall be included in the compartment and connected to the car traveling cable.

A "Handsoff®" telephone shall be provided which has been designed in response to ADAAG requirements.

2.7.4 Car Lantern and Chime

A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound.

2.7.5 Hall Fixtures

Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Raised markings shall be provided for each push-button**.**

2.7.6 Fixture Finish:

Fixture finish to be satin stainless steel all floors.

2.7.7 Landing Passing Signal

A chime bell shall sound in the car to tell a passenger that the car is either stopping at or passing a floor served by the elevator.

2.7.8 Hall Position Indicator at first floor.

PART 3 - EXECUTION

3.1 PREPARATION

Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

Installation of all elevator components except as specifically provided for elsewhere by others.

Well for Cylinder, Rock Anticipated: The cylinder well, including a casing if necessary, shall be provided by the elevator subcontractor, based upon excavation through normal soil or clay which can be removed by manual digging or with a standard truck-mounted or otherwise mobile drilling unit. If any physical obstruction or hindrance other than normal soil or clay is encountered below the ground, the elevator contractor and their subcontractor shall be provided with written authorization to proceed with excavating utilizing any required special excavation equipment. The elevator subcontractor shall be reimbursed for the additional costs incurred subsequent to encountering the physical obstruction or hindrance, including the costs of the special excavation equipment.

Hydraulic lines from the elevator equipment room shall be extended overhead above the suspended ceiling. Extending hydraulic lines in the slab shall require secondary containment piping with leak detection at no additional cost to the government.

3.3 DEMONSTRATION

The elevator contractor shall make a final check of each elevator operation with the Contracting Officer's Representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

END OF SECTION